143. Simpliyf the following expression:

$$\frac{(a^2-4b^2)^3+64(b^2-4c^2)^3+(16c^2-a^2)^3}{(a-2b)^3+(2b-4c)^3+(4c-a)^3}$$

(A) $-(a+2b)(b+2c)(4c+a)$

(B) $2(a+2b)(b+2c)(4c+a)$

(C) $(a+2b)(b+2c)(4c+a)$

(D) $4(a+2b)(b+2c)(4c+a)$

SSC CGL 2022

ALGEBRA

C – 15

147. *If* $a = 17, b = 15, c = -128$ *of* $\frac{1}{4}$,
then find the value of $a^3 + b^3 + c^3 - 3abc$?

(A) 3

(B) 2

(C) 0

(D) 1

RRB NTPC 2021

$c = -128 \times \frac{1}{4}$

$= -32$

$a = 17 / b = 15 / c = -32$

$a + b + c = 0$

148. Find the value of

$$70^3 + 20^3 - 90^3.$$

a b c

(A) 1.0 (B) 378000

(C) -378000 ✓ (D) -300000

SSC CGL 2021

$a + b - c = 0$

$a^3 + b^3 - c^3 + 3abc = 0$

$a^3 + b^3 - c^3 = -3abc$

$-3 \times 70 \times 20 \times 90$

$= -378000$

148. Find the value of

$70^3 + 20^3 - 90^3$.

a b c

(A) 1.0 (B) 378000

(C) -378000 ✓ (D) -300000

SSC CGL 2021

$70^3 + 20^3 - 90^3$

$70^3 + 20^3 + (-90)^3$

a b c

$a + b + c = 0$

$3 \times 70 \times 20 \times (-90)$

$= -378000$

$-3 \times 70 \times 20 \times 90$

$= -378000$

149. If $(a - 18)^2 + (b - 12)^2 + (c - 6)^2 = 0$, then find the value of $(a + b + c)^{\frac{1}{2}}$.

(A) ±3
(B) ±6
(C) ±4
(D) ±2

SSC CPO 2024

$a = 18$

$b = 12$

$c = 6$

$(a+b+c)^{1/2}$

$= (36)^{1/2}$

$= \pm\sqrt{36}$

$= \pm\sqrt{6 \times 6}$

$= \pm 6$ A

150. If $(a-3)^2+(b-4)^2+(c-9)^2=0$, then $\sqrt{a+b+c}$.

(A) -4
(B) 4
(C) ±4
(D) ±2

RRB NTPC 2022

$x^2 = 16$

$x = \pm\sqrt{16}$

$= \pm\sqrt{4\times4}$

$= \pm 4$

$x = \sqrt{16}$

$= \sqrt{4\times4}$

$= 4$

$\sqrt{3+4+9}$

$= \sqrt{16} = 4$

151. If $a^2 + b^2 + c^2 + 3 = 2(a + b + c)$, then the value of $(a + b + c)$

(A) 2
(B) 5
(C) 4
(D) 3

RRB NTPC 2016

$a^2 + b^2 + c^2 + 3 = 2(a + b + c)$

$\Rightarrow a^2 + b^2 + c^2 + 3 = 2a + 2b + 2c$

$\Rightarrow a^2 - 2a + 1 + b^2 - 2b + 1 + c^2 - 2c + 1 = 0$

$\Rightarrow (a-1)^2 + (b-1)^2 + (c-1)^2 = 0$

$a = 1$

$b = 1$

$c = 1$

$a^2 + b^2 + c^2 + 3 = 2(a + b + c)$

$a = \frac{1}{1} = 1$

$b = \frac{1}{1} = 1$

$c = \frac{1}{1} = 1$

152. *If* $a^2 + b^2 + c^2 = 2(a + b + c) - 3$, *then find the value of* $(a + b + c)$.

(A) 1
(B) 0
(C) 3
(D) 2

SSC CGL 2022

153. If $a^2 + b^2 + 49c^2 + 18 = 2(b + 28c - a)$, then the value of $(2a - b + 7c)$ is:

(A) -3
(B) 1
(C) -4
(D) 5

SSC CGL 2022

$a^2 + b^2 + 49c^2 + 18 = 2(b + 28c - a)$

$= a^2 + b^2 + (7c)^2 + 18 = 2b + 56c - 2a$

$\Rightarrow a^2 + 2a + 1 + b^2 - 2b + 1 + (7c)^2 - 2 \cdot 7c \cdot 4 + (4)^2 = 0$

$\Rightarrow (a+1)^2 + (b-1)^2 + (7c-4)^2 = 0$

$a = -1$

$b = 1$

$c = 4/7$

$2a - b + 7c$

$= 2(-1) - 1 + 7\left(\frac{4}{7}\right)$

$= -2 - 1 + 4$

153. If $a^2 + b^2 + 49c^2 + 18 = 2(b + 28c - a)$, then the value of $(2a - b + 7c)$ is: -18

(A) -3

(B) 1

(C) -4

(D) 5

SSC CGL 2022

$a^2 + b^2 + 49c^2 + 18 = 2(b + 28c - a)$

$a = \frac{-1}{1} = -1$

$c = \frac{28}{49} = \frac{4}{7}$

$b = \frac{1}{1} = 1$

$= \frac{4}{7}$

154. *If* $a^2 + b^2 + 49c^2 + 18 = 2(b - 28c - a)$, *then the value of* $(a + b - 7c)$ *is:*

(A) 4 (B) 3

(C) 2 (D) 1

SSC CGL 2022

$a + b - 7c$

$(-1) + (1) - 7\left(-\frac{4}{7}\right)$

$= -1 + 1 + 4$

$= 4$ A

$a^2 + b^2 + 49c^2 + 18 = 2(b - 28c - a)$

$a = \frac{-1}{1} = -1$

$b = \frac{1}{1} = 1$

$c = \frac{-28}{49} = \frac{-4}{7}$

155. If $16x^2 + 9y^2 + 4z^2 = 24(x - y + z) - 61$, then the value of $(xy + 2z)$ is :

(A) 1 (B) 2

(C) 3 (D) 5

SSC CGL 2018

$16x^2 + 9y^2 + 4z^2 = 24(x - y + z) - 61$

$16x^2 + 9y^2 + 4z^2 + 61 = 2(12x - 12y + 12z)$

$x = \frac{12}{16} = \frac{3}{4}$

$y = \frac{-12}{9} = \frac{-4}{3}$

$z = \frac{12}{4} = 3$

$xy + 2z$

$= \left(\frac{3}{4}\right)\left(-\frac{4}{3}\right) + 2(3)$

$= -1 + 6 = 5$ Ans

156. *If* $a^2 + b^2 + 64c^2 + 16c + 3 = 2(a + b)$, *then the value of* $4a^7 + b^7 + 8c^2$ *is:*

(A) $3\frac{7}{8}$ (B) $4\frac{7}{8}$

(C) $4\frac{1}{8}$ (D) $5\frac{1}{8}$ ✓

SSC CGL 2018

$a^2 + b^2 + 64c^2 + 16c + 3 = 2(a + b)$

$\Rightarrow a^2 + b^2 + 64c^2 + 3 = 2(a+b) - 16c$

$= 2a + 2b - 16c$

$= 2(a + b - 8c)$

$a = 1$

$b = 1$

$c = \frac{-8}{64} = -\frac{1}{8}$

$4a^7 + b^7 + 8c^2$

$= 4 + 1 + 8\left(-\frac{1}{8}\right)^2$

$= 5 + 8 \times \frac{1}{64}$ (64 crossed out to 8)

$5 + \frac{1}{8}$

157. If $2x^2 + y^2 + 6x - 2xy + 9 = 0$, then the value of $(4x^3 - y^3 + x^3y^2)$ is:

(A) 0

(B) 9

(C) -3

(D) -9

SSC CGL 2018

$x^2 - 2xy + y^2 + x^2 + 6x + 9 = 0$

$(x - y)^2 + (x+3)^2 = 0$

$x = y = -3$ | $x = -3$

158. If $a^2 + b^2 + c^2 + 27 = 6(a + b + c)$ then what is the value of $\sqrt[3]{a^3 + b^3 - c^3}$?

(A) 3

(B) 1

(C) 9

(D) 6

SSC CGL 2018